SONY

DATA PROJECTOR

VPL-EW130
VPL-SX125
VPL-SW125

PROTOCOL MANUAL

1st Edition (Revised 1)

⚠警告

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お客様が，このマニュアルに記載された設置や保守，点検，修理などを行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

⚠WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l’entretien. Afin de réduire les risques de décharge électrique, d’incendie ou de blessure n’effectuer que les réparations indiquées dans le mode d’emploi à moins d’être qualifié pour en effectuer d’autres. Pour toute réparation faire appel à une personne compétente uniquement.

Table of Contents

1. Overview

1-1. Introduction 1
1-2. Glossary of Terms 1
1-3. Protocol Stack Structure 1

2. Common Commands

2-1. Sub Commands 3
  2-1-1. ITEM List 3
  2-1-2. Infrared Remote Command Code 6
2-2. Reply 7

3. RS-232C

3-1. Connection 7
3-2. Communication Specifications 7
3-3. Communication Procedure 8
  3-3-1. Outline of Communication 8
3-4. Communication Rules 8
3-5. Approximate Return Waiting Times 8
3-6. Command Block Format 9
  3-6-1. Simplified Command 9
3-7. Packet Examples 10
  3-7-1. Change “ASPECT” to “ZOOM” 10
3-8. AMX Device Discovery 10

4. Ethernet

4-1. Service 11
  4-1-1. Advertisement 11
  4-1-2. PJ Talk 12
4-2. Communication Procedure 13
4-3. Protocols 14
  4-3-1. SDAP 14
  4-3-2. SDCP 15
  4-3-3. PJLink 24

1. Overview

1-1. Introduction

The projector is remotely controllable over RS-232C as well as Ethernet. It is useful for setting up the projector away from the operator.
This protocol manual describes the specifications such as packet format and procedures for controlling the projector.
In the following sections below, the term “CONTROLLER” is used as a device which controls the projector. CONTROLLER can be a PC or other specific device that is able to handle RS-232C or Ethernet.
Although most of commands are available for both RS-232C and Ethernet, some commands are dedicated to Ethernet.

* Ethernet is a registered trademark of Xerox Corporation.

1-2. Glossary of Terms

Table 1-1 Glossary of Terms

Terms	Abbreviated	Description
CONTROLLER	–	Command initiator such as PCs.
PROJECTOR	–	Front projector.
SDAP	Simple Display Advertisement Protocol	Protocol name for advertising the projector status over Ethernet.
SDCP	Simple Display Control Protocol	Protocol name for controlling projector over Ethernet.
PJLink	–	Protocol name for controlling projector over Ethernet.

1-3. Protocol Stack Structure

The protocol stack structure diagram is shown below. Though the stack is drawn for RS-232C and Ethernet separately, the following portions are common.

Table 1-2 Common Portions in Protocol Stack

Layer Name	Description
Sub Command	Value is assigned for projector’s functions. Refer to the section 2-1 for detail description.
Simplified Command	Packet format for sending/receiving “Sub Command”. Refer to the section 3-6-1 for detail description.

(1) RS-232C

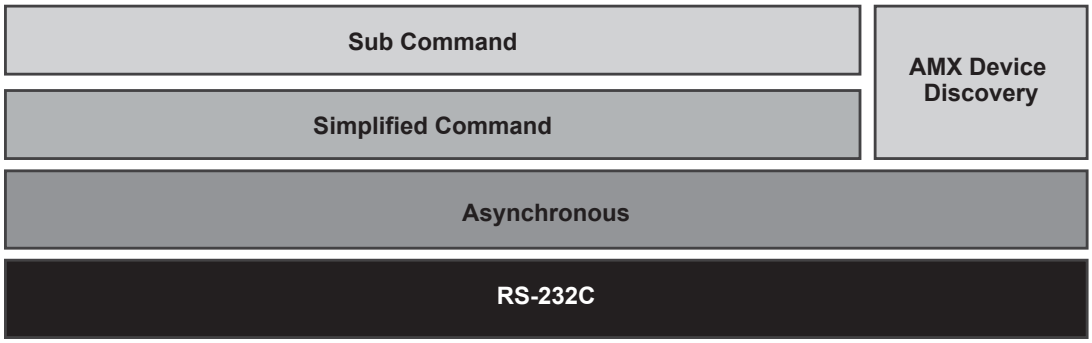


Fig. 1-1 RS-232C Protocol Stack

“RS-232C” layer is physical portion and “Asynchronous” is the traditional protocol layer as shown in the section 3-2.

(2) Ethernet

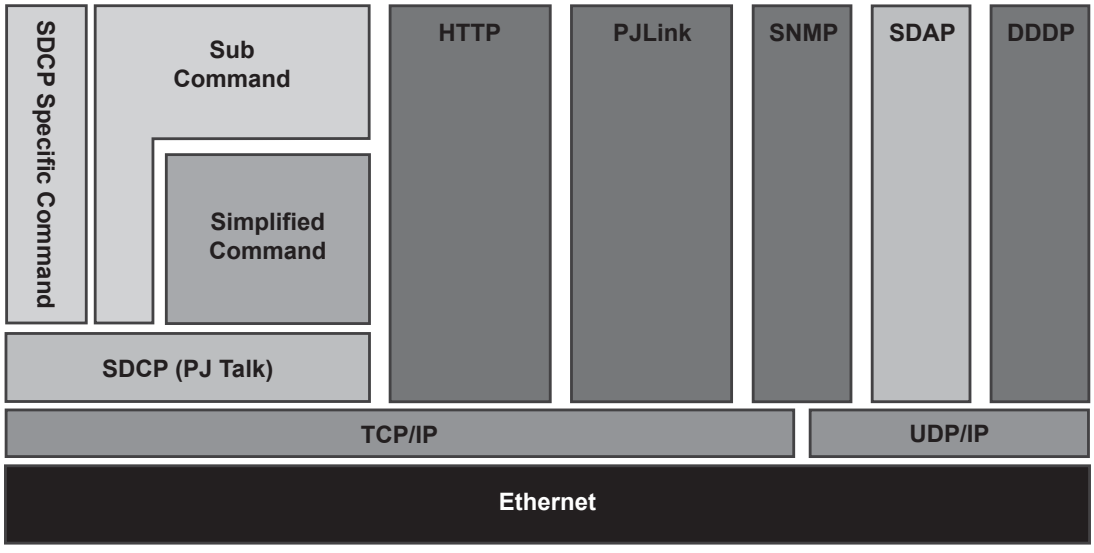


Fig. 1-2 Ethernet Protocol Stack

Ethernet corresponding model

VPL-SX125, VPL-SW125

Because of traditional portions for Ethernet general layer, “TCP/IP”, “UDP/IP” and “HTTP” are out of scope in this document.
SDCP specific command is described in the section 4-3-2.
SDAP and SDCP (PJ Talk) are SONY original protocol stack, which are described in the sections 4-3-1 and 4-3-3 respectively.

2. Common Commands

2-1. Sub Commands

Sub Command is the value which is used by Simplified Command. Value is assigned for executing function. For example, if you want to change the picture mode, the appropriate value assigned for the desired picture mode should be chosen.

2-1-1. ITEM List

Item lists are described below. Tables are shown per function category.

ITEM List For Picture

<Table 1>			<Table 2>		Remarks
Item Number			Data		
Item	Upper byte	Lower byte	Data	Byte	
PICTURE MODE	00h	02h	DYNAMIC	0000h	Set/Get
			STANDARD	0001h	
			PRESENTATION	0002h	
			GAME	0003h	
			LIVING	0004h	
			CINEMA	0005h	
CONTRAST	00h	10h	VALUE	0000h-0064h(0-100)	
BRIGHTNESS	00h	11h	VALUE	0000h-0064h(0-100)	
COLOR	00h	12h	VALUE	0000h-0064h(0-100)	
HUE	00h	13h	VALUE	0000h-0064h(0-100)	
SHARPNESS	00h	14h	VALUE	0000h-0064h(0-100)	
VOLUME	00h	16h	VALUE	0000h-0064h(0-100)	
COLOR TEMP	00h	17h	HIGH	0000h	
			MID	0001h	
			LOW	0002h	
DDE	00h	18h	OFF	0000h	
			PROGRESSIVE	0001h	
			FILM	0002h	

ITEM List For Screen

<Table 1>			<Table 2>		Remarks
Item Number			Data		
Item	Upper byte	Lower byte	Data	Byte	
ASPECT	00h	20h	FULL	0000h	Set/Get
			NORMAL	0001h	
			ZOOM	0003h	
			FULL1	0007h	
			FULL2	0008h	
			FULL3	000Ch	
			WIDE ZOOM	0002h	
			4 : 3	0009h	
			16 : 9	000Ah	

ITEM List For Setup

<Table 1>			<Table 2>		Remarks
Item Number			Data		
Item	Upper byte	Lower byte	Data	Byte	
INPUT TERMINAL	00h	01h	VIDEO	0000h	Set/Get
			S-VIDEO	0001h	
			INPUTA	0002h	
			INPUTB	0003h	
PICTURE MUTING	00h	30h	OFF	0000h	
			ON	0001h	
AUDIO MUTING	00h	31h	OFF	0000h	
			ON	0001h	
INPUT A SIGNAL-SEL	00h	32h	AUTO	0000h	
			COMPUTER	0001h	
			COMPONENT	0002h	
			VIDEOGBR	0003h	
LAMP MODE	00h	40h	HIGH	0000h	
			STANDARD	0001h	
			LOW	0002h	

ITEM List For Infrared Remote Command

<Table 1>			<Table 2>			Remarks
Item Number			Data			
Item	Upper byte	Lower byte	Data	Upper byte	Lower byte	
Infrared Remote Command (15 bit category)	17h	Refer to Section 2-1-2.*1	–	00h	00h	Set only
Infrared Remote Command (20 bit E category)	19h		–	00h	00h	
Infrared Remote Command (20 bit EE category)	1Bh		–	00h	00h	

∗1: For using this item number, the simulation of the infrared remote controller is enable. Select the corresponding code in the table of Section 2-1-2 and use it as the lower byte of the item number.

Note

Other value (the upper byte) is assigned depending for category.

ITEM List For Status

<Table 1>			<Table 2>		Remarks
Item Number			Data		
Item	Upper byte	Lower byte	Data	Byte	
STATUS ERROR1	01h	01h	NO ERROR	00h	Get only
			LAMP ERROR	01h	
			FAN ERROR	02h	
			COVER ERROR	04h	
			TEMP ERROR	08h	
STATUS POWER	01h	02h	STANDBY	00h	
			STARTUP LAMP	02h	
			POWER ON	03h	
			COOLING1	04h	
			COOLING2	05h	
			SAVING COOLING1	06h	
			SAVING COOLING2	07h	
			SAVING STANDBY	08h	
LAMP TIMER	01h	13h	VALUE	xxh	
SUB ROM VERSION	01h	1Dh	VALUE	xxh	
MAIN ROM VERSION	01h	1Eh	VALUE	xxh	
STATUS SECURITY	01h	1Fh	DISABLE	00h	
			ENABLE	01h	

2-1-2. Infrared Remote Command Code

15bit PROJECTOR

	x0	x1	x2	x3	x4	x5	x6	x7	x8	x9	xA	xB	xC	xD	xE	xF
0x																
1x			VOL LARGE	VOL:SMALL	AUDIO MUTING	POWER TOGGLE			CONTRAST +	CONTRAST –	COLOR +	COLOR –			BRIGHTNESS +	BRIGHTNESS –
2x	HUE +	HUE –	SHARPNESS +	SHARPNESS –	PICTURE MUTING	STATUS ON	STATUS OFF			MENU	VIDEO	INPUT A	INPUT B		POWER ON	POWER OFF
3x				CURSOR →	CURSOR ←	CURSOR ↑	CURSOR ↓									
4x								PITCH	SHIFT							
5x								INPUT TOGGLE			ENTER					S VIDEO
6x																
7x												RESET				

20bit PROJECTOR-E

	x0	x1	x2	x3	x4	x5	x6	x7	x8	x9	xA	xB	xC	xD	xE	xF
0x																
1x																
2x																
3x											V KEYSTONE					
4x																
5x																
6x	APA	PHASE						FREEZE			DIGITAL ZOOM +	DIGITAL ZOOM –			ASPECT TOGGLE	
7x																

20bit PROJECTOR-EE

	x0	x1	x2	x3	x4	x5	x6	x7	x8	x9	xA	xB	xC	xD	xE	xF
0x																
1x		ECO MODE														
2x																
3x																
4x																
5x																
6x																
7x																

2-2. Reply

<Table 3>			
Item Number		Data	
Item	Data	Upper byte	Lower byte
ACK	Complete	00h	00h
NAK	Select Error	01h	05h

3. RS-232C

3-1. Connection

Communication is enabled by the use of a D-Sub 9 Pin cross (reverse) cable.
The pin assignment of D-Sub 9 Pin and D-Sub 25 Pin is as follows.

D-Sub 9 Pin	D-Sub 25 Pin	Name	
Shell = FG	1	FG	Grounding for safety protection or cable shield
3	2	TxD	Transmission data
2	3	RxD	Reception data
7	4	RTS	Transmission request
8	5	CTS	Transmission permission
6	6	DSR	Data set ready
5	7	SG	GND for signal
1	8	DCD	Data channel signal carrier detection
4	20	DTR	Data terminal ready
9	22	RI	Calling display (Presence/absence of calling signal)

Pin numbers not indicated as D-Sub 25 Pin are not used.
Assured cable length: 15 m (However, assurance may not be applicable for some cables.)

The software for controlling the projector from a PC is intended for performing transmission and reception for only the TxD and RxD lines.
Therefore the handshake normally performed by RS-232C is not necessary.

3-2. Communication Specifications

- Full duplex communication channels (Flow control is not performed.)
- Start-stop synchronism system
- Baud rate: 38.4 kbps (bits per second)
- The bit configuration is defined as follows.

1 START Bit + 8 DATA Bits + 1 PARITY Bit + 1 STOP Bit

START BIT	D0 (LSB)	D1	D2	D3	D4	D5	D6	D7 (MSB)	PARITY (EVEN)	STOP BIT

EVEN Parity .....Total number of “1”s from D0 to D7 is an even number. ⇨ 0
.....Total number of “1”s from D0 to D7 is an odd number. ⇨ 1

3-3. Communication Procedure

3-3-1. Outline of Communication

All communication between CONTROLLER (PC, etc.) and DEVICE (PROJECTOR) is performed by the command block format. Communication is started by the issue of a command at CONTROLLER and ended when the return data is sent to CONTROLLER after DEVICE receives the command. CONTROLLER is prohibited from sending several commands at one time. This means that after CONTROLLER sends one command, it cannot send other commands until DEVICE returns the return data. DEVICE sends the return data after processing the command. The time from when CONTROLLER sends the command until the return data is returned differs according to the contents of the command.

Note

When SIRCS direct command is sent, return data is not sent.

3-4. Communication Rules

- When sending a command from CONTROLLER, the return data from PROJECTOR should be received first before sending the next command. Even if the next command is sent before receiving the return data, since PROJECTOR will not be able to receive that command, it does not return a response to CONTROLLER. Consequently, no error code is also sent.
  For detail of the waiting times for PROJECTOR to return the return data after CONTROLLER sends the command, refer to the section 3-5.
- When a communication error occurs, PROJECTOR ignores the data received until now, and set into the reception standby state.
- For undefined commands or commands determined as invalid by PROJECTOR, PROJECTOR will send the “NAK” as return data to CONTROLLER .
- Take note that when data is written with the unstable input signal of PROJECTOR, that data (value) will not be incorporated.
- When INDEX specified SIRCS direct command is transmitted, leave an interval of 45 msec until the next transmission. (Do not return the return data (ACK, NAK) when the SIRCS direct command is received.)
- For POWER ON/OFF/TOGGLE of the SIRCS direct command, send the command twice when this unit is in standby mode (Low) state.

3-5. Approximate Return Waiting Times

The await-return time is approx. 30 to 1000 msec.

Note

This is the case, unless the communications are interfered anyway.

3-6. Command Block Format

The block format of Simplified Command for RS-232C as shown in the figure below. In this section, the block format for Simplified Command is explained.

3-6-1. Simplified Command

[Send]

The block format for sending request is shown below.

B0	START CODE	[A9h]
B1	ITEM NUMBER	Put the item number. Refer to the item list in the sections 2-1-1 and 2-1-2.
B2		
B3	TYPE	SET: 00h (Set data) GET: 01h (Get data)
B4	DATA	SET: Put the Data value described in the item list in the sections 2-1-1 and 2-1-2. GET: Unused. Set Dummy data [00h, 00h]
B5		
B6	CHECK SUM*1	Check Sum
B7	END CODE	[9Ah]

[Receive (without data)]

The block format for response which includes no return data is shown below. Response is always sent by PROJECTOR.

B0	START CODE	[A9h]
B1	ACK / NAK	Refer to the reply definition table in the section 2-2.
B2		
B3	TYPE	[03h]
B4	DUMMY DATA	This data does not mean any senses. Dummy Data [00h, 00h] is stored.
B5		
B6	CHECK SUM*1	Check Sum
B7	END CODE	[9Ah]

[Receive (with data)]

The block format for response which includes return data is shown below. Response is always sent by PROJECTOR.

B0	START CODE	[A9h]
B1	ITEM NUMBER	Refer to the item list in the sections 2-1-1 and 2-1-2.
B2		
B3	TYPE	[02h] Express data to be Reply data
B4	DATA	Data value described in the item list in the sections 2-1-1 and 2-1-2.
B5		
B6	CHECK SUM*1	Check Sum
B7	END CODE	[9Ah]

*1: CHECK SUM: B1 to B5 are calculated by OR. Refer to the example below.

<Example of Calculation>

0xA9	1010	1001	0xA9	1010	1001
0xA9	1010	1001	0x9A	1001	1010
Answer	1010	1001	Answer	1011	1011
		0xA9			0xBB

3-7. Packet Examples

3-7-1. Change “ASPECT” to “ZOOM”

START CODE = A9h
ITEM NUMBER = 0020h (ASPECT)
SET/GET = 00h (SET)
DATA = 0003h (ZOOM)
CHECK SUM = 23h
END CODE = 9Ah

You will receive the packet below if the process is successfully completed.

START CODE = A9h
ACK/NAK = 0000h (Complete)
ACK = 03h
DUMMY DATA = 0000h
CHECK SUM = 03h
END CODE = 9Ah

There’s another way to realize the same purpose. There is “ASPECT” key on the infrared remote controller. By using this key, wide mode can be changed. Issue the Infrared Remote Command for this key several times to set wide mode “ZOOM”. Packet format will make as follows. Refer to Section 2-1-2 for “ASPECT TOGGLE”.

START CODE = A9h
ITEM NUMBER = 196Eh (ASPECT TOGGLE)
SET/GET = 00h (SET)
DATA = 0000h
CHECK SUM = 7Fh
END CODE = 9Ah

3-8. AMX Device Discovery

This model is equipped with the protocol that conforms to the Device Discovery stipulated by AMX. Contact AMX for details about the Device Discovery.

4. Ethernet

Ethernet corresponding model
VPL-SX125, VPL-SW125

4-1. Service

4-1-1. Advertisement

The advertisement service is provided to facilitate development of a PC application that can automatically detect a projector on the network. This function is achieved by broadcasting the equipment information periodically to the network.
This protocol is set to OFF by default.

[Information]
The equipment information shown below is transmitted as the broadcast packet periodically (at certain intervals).

Information	Description
Category	Category of the equipment
Equipment name	Name of the equipment
Serial number	Serial number of the equipment
Installation information	Installation location of the equipment
Community	Community name of the equipment
Power status	Power status of the equipment

Notes

- The category of projector is 0Ah.
- The power status sets FFFFh if communication error occurs.

[Protocol]
The SDAP protocol is defined in order to provide this service.

Item	Description
Protocol name	SDAP (Simple Display Advertisement Protocol)
Transport	UDP
Port number	53862 (Factory-shipments value)
Broadcast interval	Once every 30 seconds (Factory-shipments value)

[Setup Items]
The items that can be set for the advertisement service are described below.

Setup items	Description
Port No.	Port number
Interval	Broadcast interval
Broadcast Address	Adding the transmission place.

4-1-2. PJ Talk

By using PJ Talk, it is possible to communicate with PROJECTOR over Ethernet network. Both of set and get method are provided.
This protocol is set to OFF by default.

[Protocol]

Item	Description
Protocol name	SDCP (Simple Display Control Protocol)
Transport	TCP
Port number	53484 (Factory-shipments value)
TCP connection timeout	30 seconds (Factory-shipments value)

[Setup Items]

Setup item	Description
Port No.	Port number
Timeout	TCP connection timeout time
Host Address	PC address that is able to connect
Community	Header community

4-2. Communication Procedure

Communication sequence is shown below. SDCP commands must be sent by CONTROLLER and PROJECTOR responses to it. On the other hand, SDAP commands are sent by PROJECTOR and have no response from CONTROLLER.

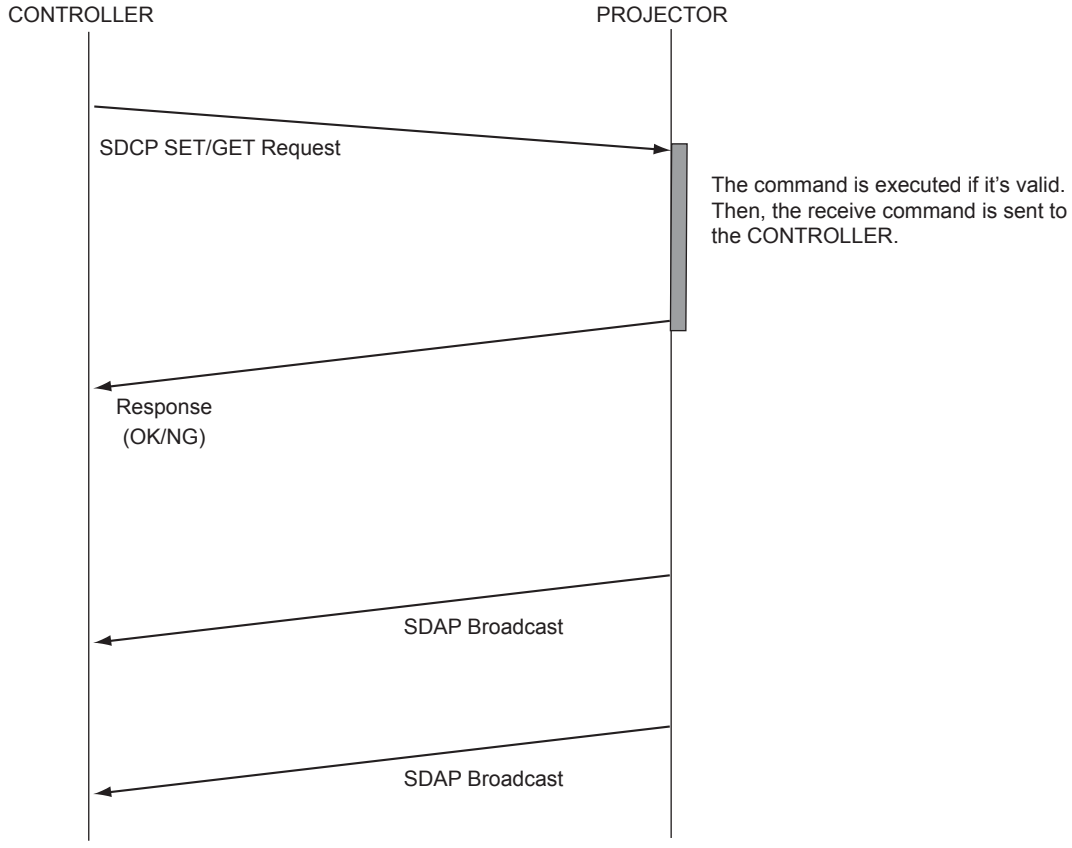


Fig. 4-1 Command Sequence

It is prohibited that CONTROLLER send another command before receiving the response to the previous command. Since PROJECTOR executes the command before sending the return data, CONTROLLER must wait a while before receiving the response. The waiting time depends on not only the commands but also network traffic.

4-3. Protocols

4-3-1. SDAP

This section describes the SDAP packet structure. The number in the parentheses shows byte.

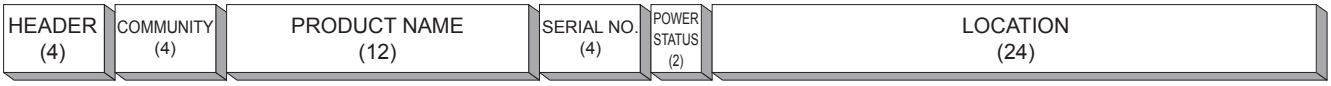


Fig.4-2 Packet structure

1. Header
   The header consists of ID (2 bytes), version (1 byte) and category (1 byte).

4441h (2)	VERSION (1)	CATEGORY (1)

Fig. 4-3 HEADER

ID
It is fixed to “4441h”.

VERSION
This indicates the version number of protocol.
It is fixed to 01h (version 1).

CATEGORY
Category number 0Ah of the projector is entered here.

2. COMMUNITY (Refer to 3. of the section 4-3-2.)
   The community that is set in the display equipment is entered.

COMMUNITY (4)

Fig. 4-4 COMMUNITY

3. Equipment Information

PRODUCT NAME
Name of equipment (Maximum twelve characters)
In case, less than twelve characters, 00h is entered in the blank space.

SERIAL NO.
Serial number is entered.

POWER STATUS
Power supply status of the equipment is entered.

LOCATION
Information of installation location (Maximum twenty four characters)
In case, less than twenty four characters, 00h is entered in the blank space.

4-3-2. SDCP

1. Packet Structure

The Fig. 4-5 shows SDCP packet format. The number in the parentheses shows byte. The statement for each field is described bellow.

Fig. 4-5 SDCP Packet Structure

2. HEADER Field

The HEADER field consists of VERSION and CATEGORY sub field shown below. The length of each sub field is 1 byte.

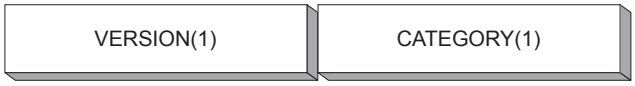


Fig. 4-6 HEADER Field

(1) VERSION sub field
This is a fixed value of 02h, which means “version2”.

(2) CATEGORY sub field
Category number 0Ah of the projector is entered here. Projector checks the category number. If a different category number is entered, the request is ignored.

3. COMMUNITY Field

When the community data matches the community that is set in the display equipment, the request is executed. COMMUNITY field should be consist of four alphanumeric characters (case sensitive). All display equipment has the default value “SONY” when shipped at the factory.

Note

COMMUNITY field should be filled with four characters. Three characters or less are not allowed.

4. COMMAND Field

There are two types of COMMAND field, which are REQUEST and RESPONSE. REQUEST command is sent to the PROJECTOR from CONTROLLER. On the other hand, RESPONSE command is sent by PROJECTOR as a response to the REQUEST command.

(1) REQUEST Command

COMMAND filed for REQUEST has three sub fields shown as follows.

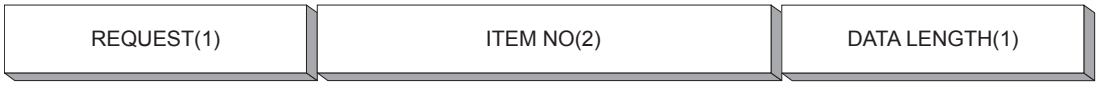


Fig. 4-7 COMMAND Filed for REQUEST

1) REQUEST sub field
   There are only two types of request. One is the GET request to acquire the projector information and status. The other is the SET request to modify the projector setup.

   SET (00h) Used to control turning the power on/off and to control the input selector, and to change the various setups.
   GET (01h) Used to acquire the installation information, equipment status and various setup values.

2) ITEM NO sub field
   Refer to 6. of the section 4-3-2.

3) DATA LENGTH sub field
   This sub field shows the length in byte of the DATA field in the SDCP packet. The maximum data length is 128 bytes. If there is no data to be sent, its value should be 0h.

(2) RESPONSE Command

COMMAND field for RESPONSE has three sub fields shown as follows.

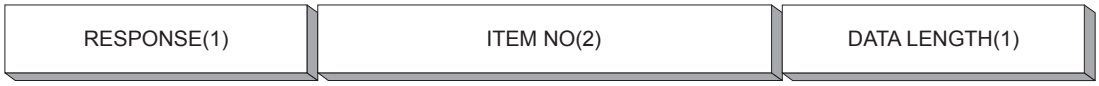
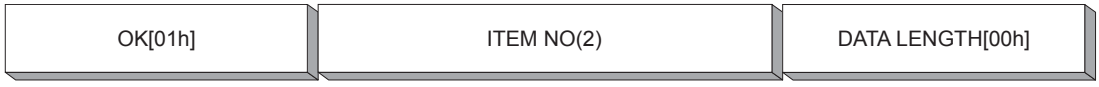


Fig. 4-8 COMMAND Filed for RESPONSE

1) RESPONSE sub field
The response returns the result of the request.

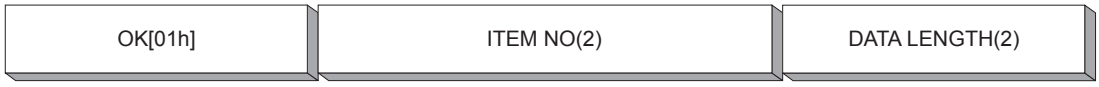
OK (01h) Indicates that the request was executed correctly.
NG (00h) Indicates that the request is illegal or cannot be executed.

(1-1) OK Response
For SET Request, the packet format will be as follows.



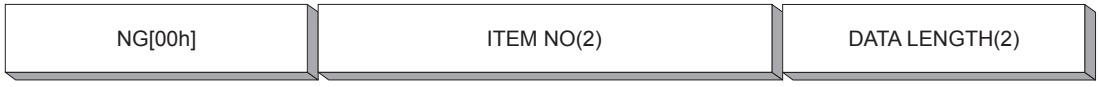
If the response for SET Request is OK, DATA field should be 00h. Therefore, DATA LENGTH field should be 00h as well.

For Get Request, the packet format will be as follows.



If the response for GET Request is OK, the DATA field which follows the DATA LENGTH field should be filled with returned data.

(1-2) NG Response
For SET/GET Request



If the response for SET/GET Request is no good, DATA field which follows the DATA LENGTH field should be filed with “ERROR CODE”. “ERROR CODE” are defined in 7. of the section 4-3-2.

2) ITEM NO sub field
Refer to 6. of the section 4-3-2.

3) DATA LENGTH sub field
This sub field shows the length in byte of the DATA field in the SDCP packet. The maximum data length is 128 bytes. If there is no data to be sent, its value should be 0h.

5. DATA Field

The content to be filled in this field depends on the COMMAND field. For SET Request commands, appropriate DATA value accompanied with ITEM NO should be chosen. ITEM NO (item number) and its data is shown in the section 2-1-1.
For the GET REQUEST and OK RESPONSE, this field should not be provided. In that case, DATA LENGTH should be 0h.

6. Items

ITEM NO sub field has two bytes long. Some of the value for ITEM NO (item number) are defined in the section 2-1-1 as a part of the Sub Command.

Table 4-1 ITEM List For SDCP

ITEM NO	Remarks	SET	GET
0000h – 00FFh	Item Numbers are defined in the section 2-1-1. Use the value of <Table2> (Data) for DATA Field.	○	○
0100h – 01FFh	Item Numbers are defined in the section 2-1-1. Use the value of <Table2> (Data) for DATA Field.	○	○
1700h – 17FFh	Item Numbers are defined in the section 2-1-1. Use the value of <Table2> (Data) for DATA Field.	○	–
1900h – 19FFh	Item Numbers are defined in the section 2-1-1. Use the value of <Table2> (Data) for DATA Field.	○	–
1B00h – 1BFFh	Item Numbers are defined in the section 2-1-1. Use the value of <Table2> (Data) for DATA Field.	○	–
7000h – 7001h	This is the RS-232C encapsulation mode. “Simple Command” can be encapsulated in the DATA field. For the packet format of the command, refer to the section 3-6-1. Use 7000h for the command which the response is expected. Use 7001h for the command which no response is expected.	○	–
8000h – 80FFh	For acquiring equipment information. Refer to the (1) below.	–	○
9000h – 90FFh	For acquiring the network setup information. Refer to the (2) below.	–	○

[SDCP Specific Command]

(1) Acquire Equipment Information

This is for acquiring information of PROJECTOR. While the higher byte is fixed as 80h shown in the table above, the lower byte is defined as follows.

Lower byte	Contents	SET	GET
00h	Category Code	–	○
01h	Model name	–	○
02h	Serial number	–	○
03h	Installation location	○	○

0x8000 Category code

1 byte

0x8001 Model name
Alphanumeric 12 characters
If the number of characters is less than 12, the remaining digits are filled with 00h.

0x8002 Serial number
4 bytes
Note
The serial number is in the range from 00000000 to 99999999.

0x8003 Installation location
Alphanumeric 24 characters
If the number of characters is less than 24, the remaining digits are filled with 00h.

(2) Acquire Network Setup Information
This is for acquiring network setting of PROJECTOR. While the upper byte is fixed as 90h, the lower byte is defined as follows.

Lower bytes	Contents	SET	GET
00h	MAC Address	–	○
01h	IP Address	–	○
02h	Subnet Mask	–	○
03h	Default Gateway	–	○
04h	DHCP	–	○

0x9000 Mac Address
6 bytes

0x9001 IP Address
4 bytes

0x9002 Subnet Mask
4 bytes

0x9003 Default Gateway
4 bytes

0x9004 DHCP
1 byte
DHCP disable: 0
DHCP enable: 1

7. ERROR CODE

ERROR CODE has two bytes long. The table below shows the error code. Each error category is explained as follows.

Category	Error	Error Code
Item Error (01**h)	Invalid Item	01h
	Invalid Item Request	02h
	Invalid Length	03h
	Invalid Data	04h
	Short Data	11h
	Not Applicable Item	80h
Community Error (02**h)	Different Community	01h
Request Error (10**h)	Invalid Version	01h
	Invalid Category	02h
	Invalid Request	03h
	Short Header	11h
	Short Community	12h
	Short Command	13h
Network Error (20**h)	Timeout	01h
Comm Error (F0**h)	Timeout	01h
	Check Sum Error	10h
	Framing Error	20h
	Parity Error	30h
	Over Run Error	40h
	Other Comm Error	50h
	Unknown Response	F0h
NVRAM Error (F1**h)	Read Error	10h
	Write Error	20h

(1) Item Error
This error occurs when the Item No. of a request is illegal or its data is illegal. The conditions for occurrence of the respective errors are shown below.

Invalid Item
An unsupported Item No. is specified.

Example 1: The unsupported category A**h is specified.
Example 2: The unsupported Item No. 8010h is specified.

Invalid Item Request
The Item No. is supported but an unsupported Request is sent.
Example: An attempt is made to set data in the Model Name (8001h).

Invalid Length
Data length of the specified Item No. is too long.
Example: An attempt is made to set 25 bytes data in the installation location (8003h).

Invalid Data
Data of the specified Item No. is outside the setting range.
Example: An attempt is made to set 101 in the Item when the setting range of the Item is 1 to 100.

Short Data
The length of data is shorter than the value specified by the data length.
Example: The actual data length is nine bytes but the specified value is 10.

Not Applicable Item
An item that is not valid at present is specified.
Example: The item to switch the display is specified when the main power is off.

(2) Community Error
This error occurs when community is different.
Example: “ABCD” is specified when “SONY” is set.

(3) Request Error

This error occurs when header or command is illegal. The conditions of occurrence of the respective errors are shown below.

Invalid Version

The version of the header is other than two.

Invalid Category

The category does not match.
Example: 0Bh is specified in the device of category = 0Ah.

Invalid Request

An unsupported request is specified.
Example: Request = 02h is specified.

Short Header

The received data is one byte.

Short Community

The received data is in the range of two to five bytes.

Short Command

The received data is in the range of six to nine bytes.

(4) Network Error

There is something wrong with TCP/IP.

Timeout

Communication was interrupted.

(5) Comm Error
Communication between Ethernet controller and main CPU has been failed.

Timeout
Timeout occurred.

Check Sum Error
A check sum error occurred.

Framing Error
A framing error occurred.

Parity Error
A parity error occurred.

Over Run Error
An overrun error occurred.

Other Comm Error
Another error occurred.

Unknown Response
The data cannot be processed was received.

(6) NVRAM Error
Read Error
Reading from NVRAM was failed.

Write Error
Writing to NVRAM was failed.

8. Packet Examples

For setting the picture mode to dynamic, the packet should be as follows.

HEADER (VERSION, CATEGORY) = (02h, 0Ah)
COMMUNITY = "SONY" = (534F4E59h)
COMMAND (REQUEST, ITEM NO, DATA LENGTH) = (00h, 0002h, 02h)
DATA = 0000h

The same result can be obtained by using ENCAPSULATION mode as well.

HEADER (VERSION, CATEGORY) = (02h, 0Ah)
COMMUNITY = "SONY" = (534F4E59h)
COMMAND (REQUEST, ITEM NO, DATA LENGTH) = (00h, 7000h, 08h)
DATA (START CODE, ITEM NO, SET/GET, DATA, CHECK SUM, END CODE)
= (A9h, 0002h, 00h, 0000h, 02h, 9Ah)

4-3-3. PJLink

The following model is equipped with the PJLink class1 protocol.
For details about this protocol, refer to the PJLink specifications published from JBMIA.
You can turn on or off the PJLink protocol and set a password from the Web setting screen > "Advertisment/PJ Talk/PJ Link" tab > PJLINK.
When the authentication setting is changed, the connected controller will be disconnected.
This protocol is set to OFF by default.

PJLink class1 corresponding model

VPL-SX125, VPL-SW125

1. Command Details

Command	Data	Remark
POWR	0	Changes the projector's power status to 'Standby'.
	1	Changes the projector's power status to 'Lamp ON'.
POWR ?		The following values are returned:
		0 : Standby
		1 : Lamp ON
		2 : Cooling state
		3 : Warm-up state
		4 : Unacceptable period
		5 : Projector defect
INPT	1*	Changes the projector input to 'RGB*'.
	2*	Changes the projector input to 'VIDEO*'.
	3*	Changes the projector input to 'DIGITAL*'.
	4*	Changes the projector input to 'STORAGE*'.
	5*	Changes the projector input to 'NETWORK*'.
INPT ?		The following values are returned:
		1*: RGB*
		2*: VIDEO*
		3*: DIGITAL*
		4*: STORAGE*
		5*: NETWORK*
AVMT	10	Cancels the projector's video muting.
	11	Sets the projector's video muting.
	20	Cancels the projector's audio muting.
	21	Sets the projector's audio muting.
	30	Cancels the projector's video + audio muting.
	31	Sets the projector's video + audio muting.
AVMT ?		The following values are returned:
		11 : Projector video muting ON
		21 : Projector audio muting ON
		30 : Projector video + audio muting OFF
		31 : Projector video + audio muting ON

Command	Data	Remark
ERST ?		The following values are returned:
		6th digit : Fan error
		5th digit : Lamp error
		4th digit : Temperature error
		3rd digit : Cover open error
		2nd digit : Filter error
		1st digit : Other error
		The following values are assigned to each digit :
		0 : No error, or detection impossible
		1 : Warning
		2 : Error occurring
LAMP ?		The following values are returned:
		Lamp accumulative time (0 to 99999)
		'1' when the lamp is on, '0' when off.
		Returns data for each lamp if there are multiple lamps.
INST ?		The following values are returned:
		Source No. of the input that can be switched
		For source Nos., refer to the section on INPT.
NAME ?		Returned value is a projector name (Max. 64 characters)
INF1 ?		Returned value is a manufacturer name (Max. 32 characters)
INF2 ?		Returned value is a model name (Max. 32 characters)
INFO ?		Returned value is desired information (Max. 32 characters)
CLSS ?		Returned value is the class of the corresponding PJLINK.

Specifications

The specifications of PJLink installed on the projector are as follows:

- Used port
  4352

- Maximum number of controllers simultaneously connected
  1 unit

- Authentication setting
  Can be set on the Web screen.
  The default settings are as follows:
  Authentication setting : Enabled
  Password : JBMIAProjectorLink

Note

When the authentication setting is changed, the connected controller will be disconnected.

• Commands
The following 14 commands are supported :
(01) [Power control command] POWR
(02) [Power status inquiry] POWR ?
(03) [Input switch command] INPT
(04) [Input switch inquiry] INPT ?
(05) [AV muting command] AVMT
(06) [AV muting status inquiry] AVMT ?
(07) [Error status inquiry] ERST ?
(08) [Lamp count/lamp time inquiry] LAMP ?
(09) [Input switch list inquiry] INST ?
(10) [Projector name inquiry] NAME ?
(11) [Manufacturer name inquiry] INF1 ?
(12) [Model name inquiry] INF2 ?
(13) [Other information inquiry] INFO ?
(14) [Class information inquiry] CLSS ?

2. PJLink Protocol Connection

When connecting a controller, the authentication procedure is required.

The projector responds as follows at the time of authentication:

When starting connection with authentication setting enabled :	Returns “PJLINK 1 random number”. The random number converts a four-byte integer into a character string.
When authentication is successful :	Waits for a command.
When authentication failed :	Returns “PJLINK ERRA”.
When starting connection with authentication setting disabled :	Returns “PJLINK 0”, and then waits for a command.

3. PJLink Protocol Command

This section provides explanation for each command.

(1) [Power control command] POWR
This command sets the projector’s power status.
The available parameters are as follows:
Parameter 1 : Projector power ON
Parameter 0 : Projector power OFF

The projector responds as follows:
When processed properly : Returns “OK”.

When parameter is out of range :	Returns “ERR2”.
Unacceptable period (when the power status is other than Standby or Power ON) :	Returns “ERR3”.
Projector error occurring (including warning) :	Returns “ERR4”.

(2) [Power status inquiry] POWR?
This command obtains the projector's power status.
The projector responds as follows:

Returns the following values when the power status is obtained:

Standby or power-saving state :	Returns "0".
Power ON state :	Returns "1".
Cooling state, or cooling state during power-saving state :	Returns "2".
Startup state :	Returns "3".

Projector error occurring (including warning) :	Returns "ERR4".

(3) [Input switch command] INPT
This command switches the projector's inputs.
The available parameter examples are as follows: (The input channel varies depending on the model.)

Parameter 21 : Projector input	Video
Parameter 22 : Projector input	S-Video
Parameter 31 : Projector input	Input A
Parameter 32 : Projector input	Input B
Parameter 33 : Projector input	Input C
Parameter 34 : Projector input	Input D
Parameter 35 : Projector input	Input E
Parameter 36 : Projector input	Input F
Parameter 41 : Projector input	USB
Parameter 51 : Projector input	Network

The projector responds as follows:

When processed properly :	Returns "OK".
When inexistent input is specified :	Returns "ERR2".
Unacceptable period (when the power status is other than Power ON) :	Returns "ERR3".
Projector error occurring (including warning) :	Returns "ERR4".

(4) [Input switch inquiry] INPT?
This command obtains the projector's input status.
The projector responds examples as follows:

Returns the following values when the input status is obtained (The input channel varies depending on the model.):
When the projector input is Video : Returns "21".
When the projector input is S-Video : Returns "22".
When the projector input is Input A : Returns "31".
When the projector input is Input B : Returns "32".
When the projector input is Input C : Returns "33".
When the projector input is Input D : Returns "34".
When the projector input is Input E : Returns "35".
When the projector input is Input F : Returns "36".
When the projector input is USB : Returns "41".
When the projector input is Network : Returns "51".

Unacceptable period (when the power status is other than Power ON) : Returns "ERR3".
Projector error occurring (including warning) : Returns "ERR4".

(5) [AV muting command] AVMT
This command sets the projector's AV muting setting.
The available parameter examples are as follows:
Parameter 11 : Projector video muting ON
Parameter 10 : Projector video muting OFF
Parameter 21 : Projector audio muting ON
Parameter 20 : Projector audio muting OFF
Parameter 31 : Projector video + audio muting ON
Parameter 30 : Projector video + audio muting OFF

The projector responds as follows:
When processed properly : Returns "OK".

When parameter is out of range : Returns "ERR2".
Unacceptable period (when the power status is other than Power ON) : Returns "ERR3".
Projector error occurring (including warning) : Returns "ERR4".

(6) [AV muting status inquiry] AVMT?
This command obtains the projector's AV muting status.
The projector responds as follows:

Returns the following values when the AV muting status is obtained:
When the projector video muting is ON : Returns "11".
When the projector audio muting is ON : Returns "21".
When the projector video + audio muting is ON : Returns "31".
When the projector video + audio muting is OFF : Returns "30".

Unacceptable period (when the power status is other than Power ON) : Returns "ERR3".
Projector error occurring (including warning) : Returns "ERR4".

(7) [Error status inquiry] ERST?
This command obtains the projector's error status.
The projector responds as follows:
Returns the response for the error status in the following format.
The error status is expressed with a six-digit number.
6th digit : Fan error
5th digit : Lamp error
4th digit : Temperature error
3rd digit : Cover open error
2nd digit : Filter error
1st digit : Other error
The number in each digit has the following meaning:
0 : No error detected
1 : Warning
2 : Error

For example, when the Fan error and the Temperature warning occur, the response will be as follows:
"201000"

(8) [Lamp count/lamp time inquiry] LAMP?
This command obtains the number of the projector's lamps and the lamp time.
The projector responds as follows:

When normal:
Returns the lamp accumulative time and the lamp illuminated state for only the available number of lamps.
For the lamp illuminated state, "1" represents lit, while "0" represents unlit.
The following table shows an example of the response from a projector.

Lamp count	Lamp 1 accumulative time	Lamp 1 illuminated state	Lamp 2 accumulative time	Lamp 2 illuminated state	Response
1	40	Lit	–	–	40 1
1	40	Unlit	–	–	40 0
2	40	Lit	20	Lit	40 1 20 1
2	40	Lit	20	Unlit	40 1 20 0
2	40	Unlit	20	Lit	40 0 20 1
2	40	Unlit	20	Unlit	40 0 20 0

Projector error occurring (including warning) : Returns "ERR4".

(9) [Input switch list inquiry] INST?
This command obtains the input switch list.
The projector responds as follows:
When normal :
Returns a source No. whose input can be switched.
The source Nos. examples are as follows : (The input channel varies depending on the model.)
Source No. 21 : Projector input Video
Source No. 22 : Projector input S-Video
Source No. 31 : Projector input Input A
Source No. 32 : Projector input Input B
Source No. 33 : Projector input Input C
Source No. 34 : Projector input Input D
Source No. 35 : Projector input Input E
Source No. 36 : Projector input Input F
Source No. 41 : Projector input USB
Source No. 51 : Projector input Network
Therefore, the response will be as follows for example:
(The number of the input channels varies depending on the model.)
"21 22 31 32 33"

Unacceptable period (when the power status is other than Power ON) : Returns "ERR3".
Projector error occurring (including warning) : Returns "ERR4".

(10) [Projector name inquiry] NAME?
This command obtains the projector name.
The projector responds as follows :

When normal :
Returns a projector name. (The projector name is displayed as a nickname for the projector's GUI.)
Returns a space when no projector name is set.

Projector error occurring (including warning) : Returns "ERR4".

(11) [Manufacturer name inquiry] INF1?
This command obtains the manufacturer name.
The projector responds as follows:

When normal : Returns a manufacturer name (SONY).

Projector error occurring (including warning) : Returns "ERR4".

(12) [Model name inquiry] INF2?
This command obtains the model name.
The projector responds as follows:

When normal : Returns a model name.

Projector error occurring (including warning) : Returns "ERR4".

(13)[Other information inquiry] INFO?

This command obtains other information.

The projector responds as follows:

When normal :	Returns a space.
Projector error occurring (including warning) :	Returns “ERR4”.

(14)[Class information inquiry] CLSS?

This command obtains the class information.

The projector responds as follows:

When normal :	Returns “1”.
Projector error occurring (including warning) :	Returns “ERR4”.

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